**Dawson College**

**Electrical Engineering Technology Department**

**Introduction to Internet of Things**

**Project Name:**

Keypad Password

**Team Members:**

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**2. Project description**

Every house has a front door lock, but sometimes that isn’t enough. This project allows you to add a PIN lock anywhere. Although our project doesn’t include any motors, it only has an LCD display and a Keypad, it would be very simple to implement a motor of sorts to allow the pin to actually work as a locking/unlocking mechanism for drawers, cabinets or even safes.

This project promotes extra privacy and security over your goods that you want to keep extra safe.

**How it works:**

* The **Keypad** is an input device used to **input the PIN.**

-It features **numbers 0 through 9**, which canbe used for the **PIN**.

-A **“#”** which is used as the **“enter”** key, to check if you inputed PIN is **correct or not**.

-An **“\*”** key which can be used to **retype** the password **without checking** it, in case you made a mistake and know about it and would like to try again without risking getting locked out.

-(The Keypad used also has “A”, “B”, “C”, and “D” keys, but they weren’t utilized in this project).

* The **LCD display** is an output device which is simply used to **give instructions**, and **inform you** if you entered the **correct password or not**.

**Final assembly diagram:**

A diagram of a calculator

AI-generated content may be incorrect.

*Figure 1 – Project Diagram*

**3. Circuit Diagram**

**Input:**

* Keypad (Membrane Switch)

**Output:**

* LCD display (LCD 1602 Module)

Below is a description of the hardware used in this project, which is also shown graphically using Tinkercad.

|  |  |
| --- | --- |
| Part | Arduino Uno Pin |
| Keypad (Membrane Switch) | ROWS → A0, A1, A2, A3  COLS → D5, D4, D3, D2 |
| LCD display (LCD 1602 Module) | K → GND  A → VCC (+5V)  D7 → D12  D6 →D11  D5 →D10  D4 →D9  E → D8  RW → GND  RS →D7  V0 → GND (through a 1kΩ resistor)  VDD → VCC (+5V)  VSS → GND |
| +5v Rail | 5V Pin (red) |
| GND Rail | GND Pin (black) |

A close-up of a circuit board

AI-generated content may be incorrect.

*Figure 2 – Circuit Connections Diagram, image from Tinkercad.*

**Notes about the circuit assembly:**

1. We used the analog pins A0, A1, A2, A3, because we didn’t have enough digital pins due to the LCD display needing so many. It should work perfectly as intended despite the analog pins being used instead of the digital pins.

**4. Code Documentation**

**4.1 Libraries Used**

#include <Keypad.h>           // Includes the library for the keypad

#include <LiquidCrystal.h>    // Includes the library for the LCD display

Keypad library allows use to use functions designed for the keypad, allowing use to use simpler code and not have to code the entire keypad from scratch.

LiquidCrystal library, similarly, allows use to use built in functionsto facilitate the code using the LCD display.

**4.2 Global Constant & Pins**